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FIFTH BI-MONTHLY PROGRESS REPORT  
UNIVERSITY OF ALASKA  
ERTS PROJECT NO. 110-2  
June 1, 1973

A. TITLE OF INVESTIGATION: Identification of Phenological Stages and Vegetative Types for Land Use Classification

B. PRINCIPAL INVESTIGATOR/GSFC ID: Ivan Branton/UN 641 (a request to change PI to Jay D. McKendrick has been submitted)

C. PROBLEMS IMPEDING INVESTIGATION:

We have had some difficulty locating specific stands of vegetation on the computer printouts in areas where land forms are rather uniform. The delay in delivery of the CDU has caused us to rely on computer printouts for analyzing digital data. If the CDU was available we could test our signature validities in less time and at less cost than on the computer.

During late April and early May, the colors of natural vegetation in Alaska are most distinct. For example: birch are reddening, Populus spp. are grey, the grasses are yellow-brown and the spruce are green. In that season we are able to easily identify the various vegetation communities from low flying aircraft and on aerial color photos. However, in 1972 the satellite was not orbiting during that period, and in 1973 storm systems moved across our test areas during the two early spring sampling periods. Data collections during the last week of April one week earlier than the actual sampling period would have occurred during clear weather and provided extremely valuable data.

D. PROGRESS REPORT:

1. Accomplishments during reporting period.

Two printouts of digital MSS data have been received from the U of A

N73-24379

IDENTIFICATION OF  
PHENOLOGICAL STAGES AND VEGETATIVE TYPES  
FOR LAND USE CLASSIFICATION Bimonthly  
Progress Report (Alaska Univ., Palmer.)  
CSCL 08F G3/13 00618  
6 p HC \$3.00

Unclas

computer center for scene 1049-20505. We were very pleased with our progress on identifying MSS signatures of vegetation, particularly for spruce, birch and grass. Areal extents of these types were also computed from digital data for the Matanuska-Susitna test area.

A light table was constructed for drawing vegetation overlay maps at 1:250 K from 70 mm MSS chips. Vegetation maps 1:250 K scale were hand drawn from projections of 70 mm MSS chips for the Matanuska-Susitna Valleys, and Kenai Peninsula. These maps show vegetation distribution but, are very general compared to the details contained in our digital data maps.

Ground truth was collected along the west side of Cook Inlet and on the Kenai Peninsula during travel on other projects. These data have proven valuable for interpreting ERTS-1 imagery.

ERTS-1 data are being used in locating potential grazing lands on the Kenai in connection with the University of Alaska's red meat research program. One rather extensive, although presently inaccessible, grassland was discovered on scene 1066-20453.

Prints (8" x 10") of color additive viewer displays were ordered and received. These proved useful for mapping vegetation features; however, in many instances black and white data were either equal to or better than the color products for identifying boundaries of tonal differences.

Two formal presentations were held to explain the ERTS program; both included showing a NASA information film. The first presentation was to personnel at the Palmer Research Center of the Institute of Agricultural Sciences. The second was for the Alaskan Power Administration. We were also contacted by a planner from the Greater Anchorage Area Borough concerning the possible use of ERTS data for their land use planning program.

Partial shipment of 75 ERTS scenes for 1973 was received. These have been evaluated for quality (See appendix), indexed and filed.

An agreement was finalized with the Federal-State Land Use Planning Commission. They are supplying 50% of the funds required to purchase a Zoom Transfer Scope. The balance of the purchase price is being supplied from other Institute of Agricultural Sciences projects. The Land Use Planning Commission and those IAS projects will receive information from ERTS data and/or use of the Zoom Transfer Scope in return for their financial contributions to the ERTS program.

## 2. Plans for next reporting period.

A request for contract extension to January 30, 1974 with no increase in NASA funding has been submitted through channels in order to give us access to a full year's data (all seasons) and an opportunity to use automated data processing with the CDU. We will continue using conventional mapping techniques on the 9 1/2" prints and 70 mm chips. As we complete the mapping for the Matanuska-Susitna test areas our emphasis is shifting to the Kenai test area. A portion of the salary for one of our key ERTS personnel is being paid from funds of another IAS research project that involves work on the Kenai during June. We expect our ERTS program to benefit greatly from this arrangement.

Digital data will be analyzed to identify signatures and produce printouts on scenes 1103-20503, 1066-20453. We expect to use the CDU for testing signature validity and mapping (scene 1049-20505), if the unit is available. The Zoom Transfer Scope is expected to be a powerful tool for testing signature validities, locating plant community boundaries and mapping vegetation from digital and image data.

E. SIGNIFICANT RESULTS:

From 70 mm chips and black and white prints, two 1:250 K vegetation maps were constructed from ERTS MSS scenes 1049-20505 and 1066-20453. Total land areas mapped were approximately 1,000,000 acres and 2,500,000 acres respectively. Digital data were used to construct a vegetation map of 464,000 acres in the Matanuska-Susitna Valleys. Areal extents of each vegetation type identified were also extracted from those data. The map from the digital data is the only available vegetation map of the area showing detailed distributions of birch and spruce.

F. PUBLICATIONS:

None.

G. RECOMMENDATIONS:

Data collections for vegetation mapping are needed in the early spring in Alaska when vegetation types are radiometrically most distinct. Since weather uncertainties create problems in early spring, possibly a manned platform that could be directed to collect data when conditions are best (i.e. Skylab) could overcome the cloud interference problem. Extremely accurate vegetation maps of Alaska could be constructed from ERTS data collected during that season of the year compared to either winter or summer seasons when vegetation types are radiometrically less distinct.

H. CHANGES IN STANDING ORDER FORMS:

Original order date 6/20/72

Revised order date 11/9/72

I. ERTS IMAGE DESCRIPTORS FORMS:

Completed forms from new data received are attached.

J. DATA REQUEST FORMS:

None.

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FIFTH BI-MONTHLY PROGRESS REPORT  
UNIVERSITY OF ALASKA  
ERTS PROJECT NO. 110-  
JUNE 1, 1973

PRINCIPAL INVESTIGATOR: C. Ivan Branton

TITLE OF INVESTIGATION: Identification of Phenological Stages and  
Vegetative Types for Land Use Classification

DISCIPLINE: Agriculture/Forestry/Range Resources

SUBDISCIPLINE: Range Survey and Classification

SUMMARY OF SIGNIFICANT RESULTS:

A large grassland was located on the Kenai Peninsula which may be a potential grazing land. Two 1:250 K vegetation maps were constructed from ERTS scenes 1049-20505 and 1066-20453 using 70 mm MSS chips and black and white prints for an area of 3.5  $\bar{M}$  acres. Another area (464,000 acres) was mapped using digital data. The latter map is the most accurate and detailed vegetation map of that area produced to date. Areal extents of identified vegetation types were derived for the area mapped from digital data. Early spring (prior to leafing out of the deciduous trees) is suspected as being the best time for mapping Alaskan vegetation from MSS data due to the radiometrically distinctness of the vegetation communities at that time.

## APPENDIX A

**(See Instructions on Back)**

PRINCIPAL INVESTIGATOR C. Ivan Branton

GSFC UN-641

**ORGANIZATION** University of Alaska Project 110-2

**D** \_\_\_\_\_

**N** \_\_\_\_\_

ID \_\_\_\_\_

PRODUCT ID (INCLUDE BAND AND PRODUCT)	FREQUENTLY USED DESCRIPTORS*			Mts.	DESCRIPTORS
	River	Glacier	Lake		
1226-20340	✓		✓	✓	Agriculture, Hwy, Snow
1227-20394	✓		✓	✓	Agriculture, Hwy, Snow
1228-20464		✓	✓	✓	Snow, Spit, Coast- line
1231-21024	✓	✓		✓	Snow
1247-20511	✓		✓	✓	Airstrip-Snow
1247-20514	✓	✓		✓	Snow
1260-20232		✓		✓	Snow
1261-20284	✓	✓	✓	✓	Snow
1261-20291	✓	✓	✓	✓	Snow
1262-20340	✓		✓	✓	Agriculture-Snow
1262-20343	✓	✓	✓	✓	Snow
1265-20502	✓			✓	
1265-20514	✓			✓	

**\*FOR DESCRIPTORS WHICH WILL OCCUR FREQUENTLY, WRITE THE DESCRIPTOR TERMS IN THESE COLUMN HEADING SPACES NOW AND USE A CHECK (✓) MARK IN THE APPROPRIATE PRODUCT ID LINES. (FOR OTHER DESCRIPTORS, WRITE THE TERM UNDER THE DESCRIPTORS COLUMN).**

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